

In the Background of the Invention

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A further significant advance in the art of knife assemblies for use in wood cutting apparatus is represented in U.S. patent application Serial No. 09/918,895 to ~~Loren R. Schuh and Tobias L. Simonsen~~ assigned to Key Knife Inc. The knife disclosed therein has deflector ridges on a front side of the knife to receive a mating projection of the counterknife in the manner of Schmatjen, U.S. Patent No. 5,819,826, along with a recess in a back side of the knife to receive a mating projection from the outer clamping member of the clamping assembly. The counterknife is relieved and formed so that a definite "three-point" contact is made between the assembly and the knife comprising two points on the bottom surface of the knife and one point on the top surface of the knife. The two points of contact on the bottom surface of the knife are spaced as far apart as is practical, and the third point falls between these two points so that the knife is held in a stable configuration. Yet, the knife remains easy to remove from the assembly, and the complementary features provided in the outer clamping member and the knife actually improves the assembly in this regard.

In the Detailed Description of Preferred Embodiments

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Turning to Figure 3, each head described above includes a plurality of stacked disc portions 6 (hereinafter "disc"), each disc supporting a plurality of knives 2. The knives 2 are held in knife assemblies 3 comprising outer and inner clamping members 3a and 3b, respectively, where the inner clamping member is often referred to as a "counterknife." Cutting edges 2a of the knives 2 are exposed for cutting the wood 8 ~~11~~, the cutting edges extending along an axis that is perpendicular to the plane of the Figure. The knife assemblies are mounted to a rotating disc 6. The disc 6 and therefore the knives 2 rotate about an axis of rotation "L" that is also perpendicular to the plane of the Figure in a direction of rotation "R." The double-sided knives 2 also include cutting edges 2b that are not exposed unless the knives are removed and turned end-for-end. Additional knives 4 may also be provided with cutting edges parallel to the plane of the Figure so that, together, the knives 2 and 4 may cut corners in the wood 8. For example, if the article of wood 8 is a log as shown in Figures 2A, the knives 2 and 4 may be used to cut the corner C, as shown in Figure 2E.

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For comparison with the present invention, Figure 4 shows a cross-sectional view of the prior art knife described in Schmatjen, U.S. Patent No. 5,819,826 is shown. The knife is elongate with an elongate axis perpendicular to the plane of the Figure (not shown). The double-sided knife has two cutting edges 14a, 14b, two "deflector ridges" 16a, 16b on a front side 17 of the knife, and a semi-circular recess 18 on a back ~~surface~~ side 19 of the knife, which joins the ~~bottom surface~~ front side 17 at the cutting edges 14a and 14b. The deflector ridges extend outwardly from the front side 17 and define a channel that provides an interlocking feature for interlocking with the counterknife.

This function could be provided by other structures, such as the keyway disclosed in U.S. Patent No. 4,850,408. However, the deflector ridges also include concave curved outer surfaces 7 for

deflecting wood chips from the counterknife, the outer surfaces 7 terminating in a line 9 8 which is seen as a point in the Figure.

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Also for comparison with the present invention, Figure 5 shows a cross-sectional view of a knife assembly 20 for attachment to a disc 6, for clamping the knife 12 so as to provide “three-point contact” with the knife. The knife assembly 20 includes an outer clamping member 22 and an inner clamping member or counterknife 24. The counterknife 24 includes two lands 24a and 24b for making contact with the ~~bottom surface~~ front side 17 (Figure 4) of the knife 12, and is otherwise relieved so that no other contact is made with the knife. The upper clamping member includes a projection 26 that is received by the recess 18 (Figure 4) of the knife, and is otherwise relieved so that no other contact is made with the knife.

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Now turning to Figure 6, a cross-sectional view of a knife 33 according to the present invention is shown. The knife is elongate with an elongate axis that is perpendicular to the plane of the Figure. The double-sided knife has two cutting edges 31a, 31b, and an interlocking feature 35 comprising two deflector ridges 36a, 36b on a front side 37 of the knife, and an interlocking feature 38 on a back side 39 of the knife, which joins the ~~bottom surface~~ front side 37 at the cutting edges 31a and 31b. The interlocking feature ~~37~~ 35 is adapted to mate with a corresponding feature in the counterknife, to index the knife to the counterknife, and the interlocking feature 38 is adapted to mate with a corresponding feature in the outer clamping member, to index the knife to the outer clamping member. The interlocking features may serve additional functions, as do the deflector ridges.